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GB 2258585 A EP 0491516 A2 EP 0457077 A2

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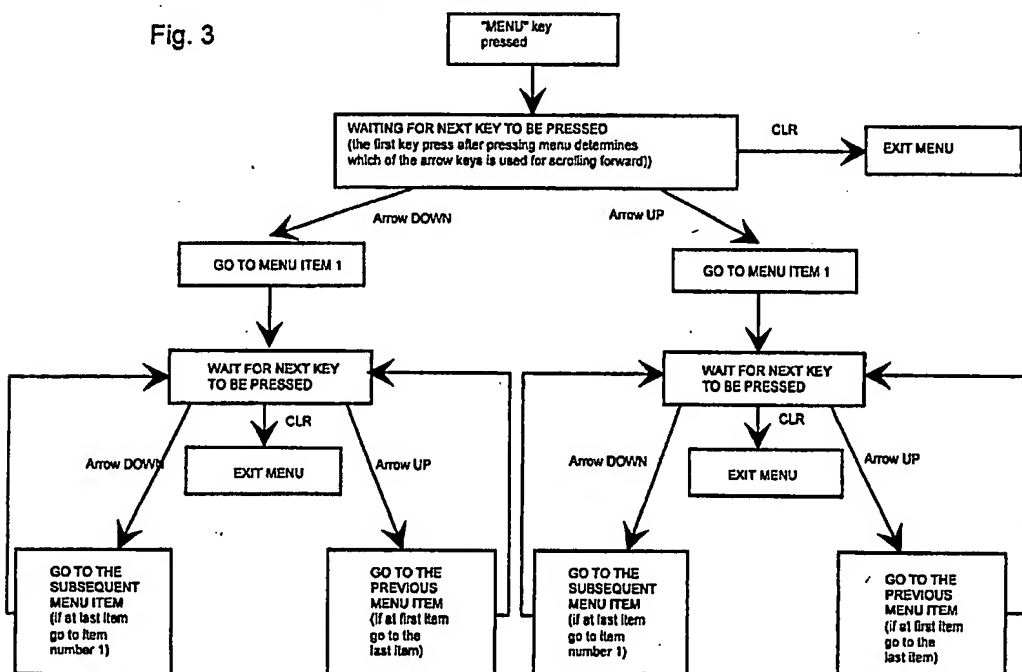UK CL (Edition M) H4K KBNJ KFH
INT CL⁵ H04M
ONLINE : WPI

(54) User interface for a telephone

(57) The method solves the problem of remembering the directional assignments of the arrow keys used in scrolling the menus of telephones, particularly mobile phones. Such phones incorporate function menus which are scrolled using arrow keys. The method permits redefining the direction of scrolling determined by the arrow each time the device is used so that it corresponds to the user's preferences. The principle is that the first time a key is pressed, the menu always goes to its first item regardless of the direction indicated by the arrow (down or up). The next times the arrow keys are pressed, they conform to the directional assignments of the arrows defined when the key was pressed the first time.
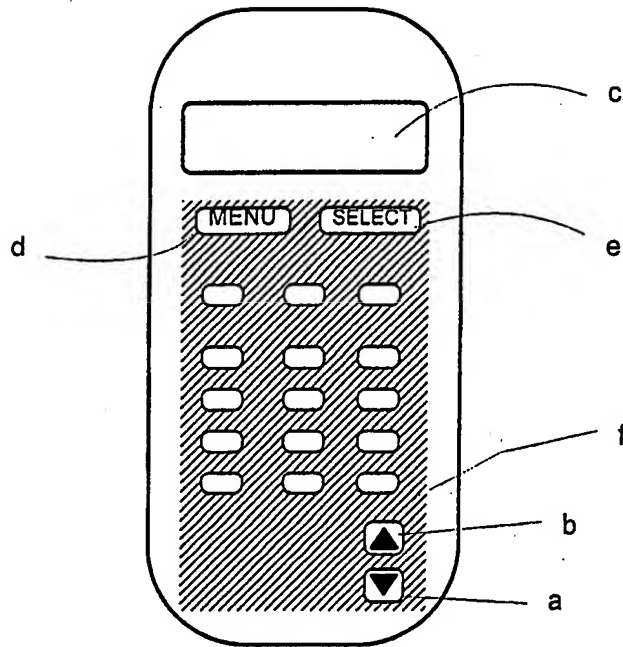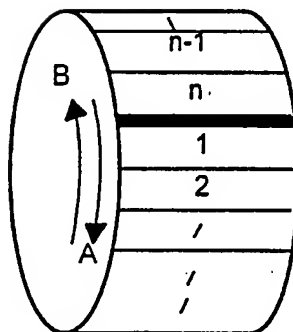
Fig. 3
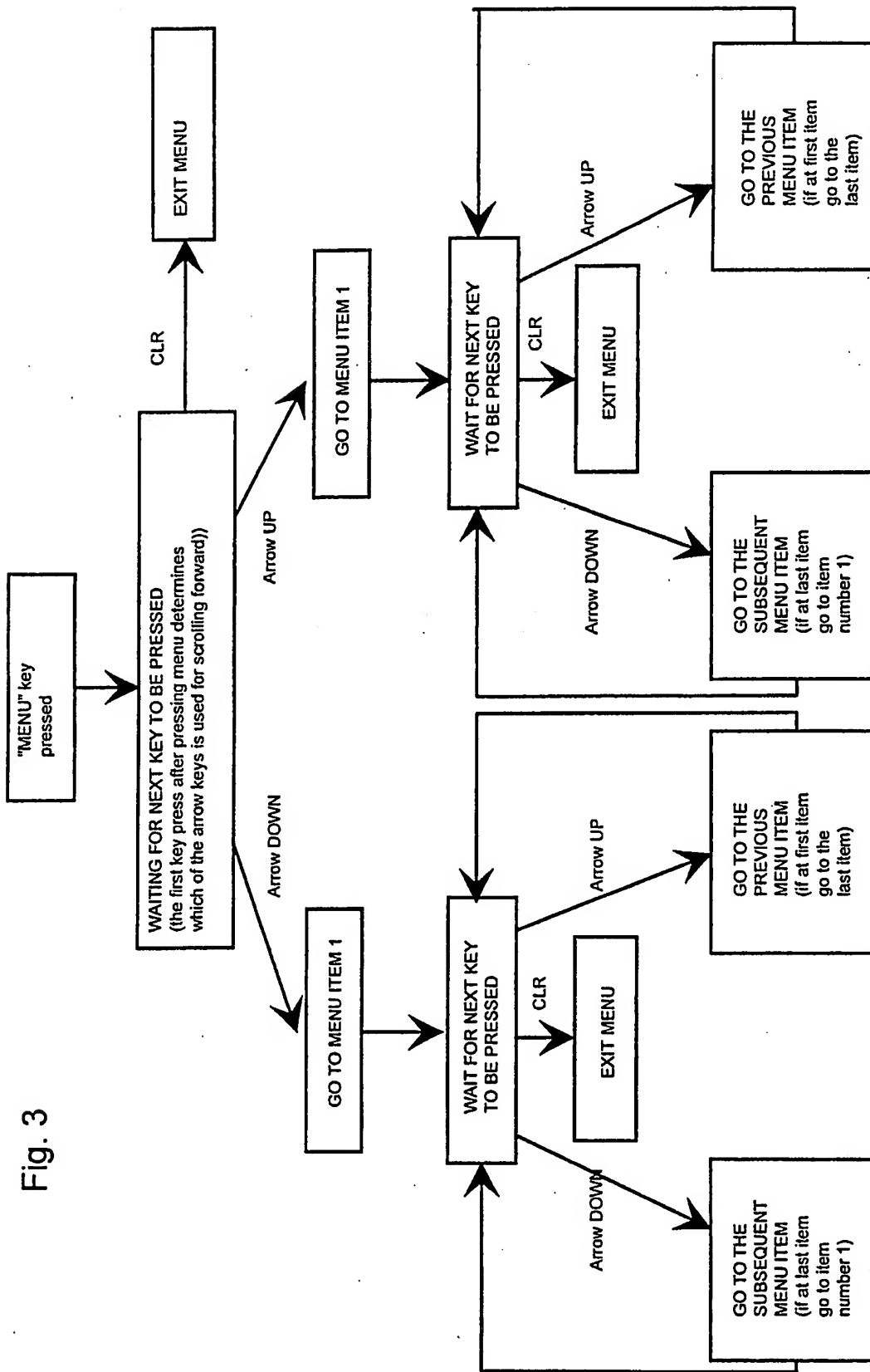

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Fig. 1

Fig. 2

Fig. 3

"MENU" key
pressed

WAITING FOR NEXT KEY TO BE PRESSED
(the first key press after pressing menu determines
which of the arrow keys is used for scrolling forward))

CLR → EXIT MENU

Arrow UP → GO TO MENU ITEM 1 → WAIT FOR NEXT KEY
TO BE PRESSED

CLR → EXIT MENU

Arrow UP → GO TO THE
PREVIOUS
MENU ITEM
(if at first item
go to the
last item)

Arrow DOWN → GO TO THE
SUBSEQUENT
MENU ITEM
(if at last item
go to item
number 1)

Arrow DOWN → GO TO MENU ITEM 1 → WAIT FOR NEXT KEY
TO BE PRESSED

CLR → EXIT MENU

Arrow UP → GO TO THE
PREVIOUS
MENU ITEM
(if at first item
go to the
last item)

Arrow DOWN → GO TO THE
SUBSEQUENT
MENU ITEM
(if at last item
go to item
number 1)

<u>A user interface for a telephone</u>

The invention relates to a method and apparatus by which the directional assignments of the arrow keys of the user interface of a telephone, particularly a mobile phone, can be defined when scrolling the user interface's menu.

A user interface is taken to mean the interface between the user and the device, by means of which the user can enter data in the device and obtain as a response an output indicating the functions carried out by the device. The user interface of a modern advanced telephone or mobile phone is generally understood to be the keypad and display. The keypad of such a telephone includes not only the alphanumeric keys but possibly also various function and selection keys, for example, arrow keys. The size of the display is limited, particularly in a mobile phone because of its small size, generally to a few tens of characters that can be displayed.

The fundamental idea behind menu-based functions is generally to increase the user-friendliness by offering the user a group of alternatives for executing the next function and thus to reduce the need for functions that must be memorized. The items of the menu can in principle be envisioned in a circular arrangement, whereby during scrolling in any direction whatsoever all the items can be reached sooner or later. The device can incorporate several menus, which means that the selection of the menu to be scrolled must be made before the actual scrolling by means of a key defined for this purpose or by pressing keys in a given sequence. The menu can be selected by pressing the user interface's MENU, SELECT or equivalent key. Arrow keys are used to scroll the menu. The assignments of the arrow keys are generally permanently defined; for example, an upward-pointing arrow means scrolling the menu backwards and, similarly, a downward-pointing arrow indicates

scrolling forwards, or an arrow to the right means scrolling forwards and an arrow to the left means scrolling backwards. The device's display generally shows, within the limits permitted by the size of the display, either all the menu's items or only part of them. If more than one item of the menu is visible in the display at the same time, then the active item, i.e., the one to which the scrolling has progressed, appears in the display usually in a form that differs somewhat from the other items either in terms of its background colour or in some other respect. The small size of the display of video telephones generally limits the number of items that can be displayed to one, i.e., the active item.

Remembering the assignments of the arrow keys when scrolling a menu has in practice turned out to be a problem and users repeatedly criticize their illogical nature. It has indeed been estimated that some 50% of users tend to start scrolling the menu with the upward-pointing arrow key, whereas another 50% use the downward-pointing arrow key. The objective, however, is nearly always to move forwards in the menu, i.e., to the first item which, in line with the principle according to which menus are generally arranged, is precisely the menu's most frequently used item. Consequently, in the majority of usage situations half of the users have to press a key or keys several times instead of getting to the desired item with a single press of a key. The problem becomes particularly apparent in the new generation of digital mobile phones, which have as many as three times the number of menu items as the present analog phones have.

Various alternatives have been presented to resolve the problem. For example, the user can change the arrow assignment to what he wants by pressing a key reserved for this purpose or alternatively one or more existing keys in a new sequence. It could also be envisaged that the telephone dealer would permanently set the scrolling direction in accordance with the buyer's

preferences. The problem with solutions of the above-mentioned type would still be remembering the arrow assignments, especially when the menu is seldom used. In addition, there are users for whom understanding the principle of scrolling the menu is, on the whole, difficult.

The method according to claim 1 solves the problem connected with remembering the arrow key assignments.

The basic idea is that the assignment of the arrow keys is determined in each usage situation on the basis of the arrow key first pressed. In the method according to the invention, the first press of an arrow key, regardless of the direction indicated by the arrow, always scrolls the menu forwards, i.e., it puts the menu's first item into the active state. In practice the active item appears in the telephone's display. The next times the arrow keys are pressed, this conforms to the directional assignments that were defined when the key was pressed the first time. For example, when the first key pressed is the arrow-down key, then the next times it is pressed, the assignment of the downward-pointing arrow is forwards and, similarly, the assignment of the upward-pointing arrow is backwards. The directions are defined in a corresponding manner when the first key pressed is the arrow-up key or either of a pair of keys pointing to the right and left.

In a preferred embodiment, the selection of the menu to be scrolled takes place by means of the MENU, SELECT or a similar key. In a preferred embodiment, instead of the feature menu the scrolling may relate to, for example, a menu containing the telephone's abbreviated dialling numbers.

In summary it can be observed that the method is advantageous, i.e., it minimizes the number of times keys are pressed, in the following cases: when selecting the menu's most used items, when the user forgets the directional

assignments of the arrows and when the location of the menu item to be accessed is forgotten. These criteria fulfil approx. 95% of the usage situations. The method is disadvantageous compared with the current art when the following conditions are fulfilled: when selecting the menu's least used items and the user remembers that they are last in the menu, and the user furthermore remembers which of the arrow keys are used for scrolling backwards. A situation of this sort represents approx. 5% of the usage situations.

The invention is discussed in the following with reference to the accompanying drawings, in which

Figure 1   shows a user interface of an example mobile phone,

Figure 2   shows the principle of scrolling the menu and

Figure 3   shows a flow diagram illustrating the scrolling.

Figure 1 shows a very simplified view of the user interface of a mobile phone. The display part is described by area c and the keypad by the cross-hatched area f. The cross-hatched area f can contain a varying number of different keys, of which only a few that are essential from the standpoint of the invention, are dealt with in detail in the following. The user interface embodies a pair of keys marked with arrows pointing in opposite directions. The arrow markings can be, in accordance with Figure 1, down a and up b or also to the right and the left. When the menu is scrolled, the item that is active at any given time is output to the mobile phone's display c. The menu selection can be made with the user interface's MENU or SELECT keys d, e or with a corresponding key. The designations and disposition of the keys in Figure 1 can vary freely in different applications.

The menu shown in Figure 2, which is represented in a circular form, is

comprised of n items. The menu can be scrolled with the arrow keys a, b both forwards A and backwards B. According to the general principle of arrangement, the first item 1 is the menu's most frequently used function and, correspondingly, the last item n is the menu's least used function. It is generally possible to show only one of the menu's items in the mobile phone's display at a time. The item that is in the display at any given time is the so-called active item, and it is the one which the scrolling has reached. In the method according to the invention, the first time either, but only one, of the keys a, b are pressed after the menu to be scrolled has been selected, this moves the menu's first item 1 into the mobile phone's display c. The direction of scrolling when pressing the key the first time is forwards A and, correspondingly, the direction of scrolling of the key marked with an arrow in the opposite direction is backwards B. For example, if the key a is pressed first, its direction of scrolling is henceforth forwards A and the direction of scrolling of key b is backwards B.

In Figure 3 the operation according to the invention is further shown in the form of a flowchart. After a menu selection has been made with the MENU key, the arrow key that has been pressed first (down or up) puts the menu's first item into the active state. The next times the key is pressed, the forwards scrolling is the same as was defined with the first pressing of the key (up or down) and scrolling backwards is the opposite direction for the first pressing of the key (down or up).

The patent claims do not limit the stage of use in which the method can be applied or how often this is done. For example, the method can be used to define the assignments of the keys separately each time the menu is used or only the first time it is used or according to any other criterion.

The invention can be applied particularly to mobile phones, but also, for

example, to desk phones which are equipped with a display and a keypad and incorporate the scrolling of menus.

Claims

1.   A user interface for a telephone comprising user operable keys for scrolling through displayed options in forward and reverse directions, the direction of scrolling associated with respective ones of said user operable keys being assigned in response to an initial use of the user operable keys for scrolling through the displayed options.

2.   A user interface according to claim 1 wherein the initial use of the user operable keys comprises operating one of the user operable keys, the direction assigned to the one of the user operable keys being forwards.

4.   A user interface according to any preceding claim wherein the directions associated with user operable keys are assigned each time the options are displayed.

5.   A user interface according to any preceding claim wherein the user operable keys comprise first and second keys indicating respective opposite directions.

6.   A user interface according to any preceding claim wherein the displayed options comprise a menu having a plurality of sequentially actuable items.

7.   A user interface according to any preceding claim wherein the direction associated with each of the user operable keys is assigned each time a user accesses the displayed options.

8.   A user interface according to any one of claims 1 to 6 wherein the direction associated with each of the user operable keys is permanently assigned.

9. A method for scrolling through options displayed by a telephone in forward and reverse directions using user operable keys, the direction of scrolling associated with respective ones of said user operable keys being assigned in response to the initial use of the user operable keys for scrolling through the displayed options.

10. A method for determining the directional assignments of the arrow keys of the user interface of a telephone, particularly a mobile phone, when the user interface's menu is scrolled, characterized in that when either key (a or b), but only one, of a pair of arrow keys (a, b) marked with an arrow pointing in opposite directions is pressed for the first time, the direction of scrolling is always forwards, whereby it is arranged that the menu's first item (1) is put into the active state in the display (c), and the next times the arrow keys are pressed, the direction of scrolling conforms to the directional assignments of the arrows defined by pressing the key the first time.

11. A method according to claim 10 characterized in that the directional assignments of the arrow keys are defined separately each time the menu is used.

12. A method according to claim 10 or 11 characterized in that the menu to be scrolled is a function menu which is selected with the user interface's MENU (d), SELECT (e) or equivalent key.

13. A method according to any one of claims 10 to 12 characterized in that the menu to be scrolled is a menu containing abbreviated dialling numbers.

14. A user interface for a telephone substantially as hereinbefore described with reference to Figures 1 to 3 of the drawings.

		Application number
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Examiner's report to the Comptroller under Section 17		
(The Search report)		

Relevant Technical Fields	Search Examiner AL STRAYTON
(i) UK Cl (Ed.M) H4K: KBNJ; KFH	
(ii) Int Cl (Ed.5) H04M	Date of completion of Search 10 AUGUST 1994
Databases (see below) (i) UK Patent Office collections of GB, EP, WO and US patent specifications.	Documents considered relevant following a search in respect of Claims :- ALL
(ii) ONLINE: WPI	

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&: Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages	Relevant to claim(s)
A	GB 2258585 A (MOTOROLA)	
A	EP 0491516 A2 (FORD)	
A	EP 0457077 A2 (ROLM)	

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